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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/996,633 | 11/28/2001 | Athanasios Agamamnon Kasapi | 15685P107 | 3477 |

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| EXAMINER | |
|---|---|
| NGUYEN, TU X | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2684 | |

DATE MAILED: 04/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/996,633 | KASAPI, ATHANASIOS AGAMAMNON | |
| | Examiner | Art Unit | |
| | Tu X Nguyen | 2684 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *15 March 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-40* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,8,9,12-18,22-24,26-28,30-34 and 37-40* is/are rejected.

7)☒ Claim(s) *7,10,11,19-21,25,29,35 and 36* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Response to Amendment*

1. Applicant's arguments with respect to claims 1-6, 8-9, 12-18, 22-24, 26-29, 30-34 and 37-40 have been considered but are moot in view of the new ground(s) of rejection.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-6, 8, 23-24, 28, 30-33, 37 and 39, are rejected under 35 U.S.C. 103() as being unpatentable over Wallace et al. (US Pub 2002/0193146) in view of Kay (US Patent 5,812,935).

Regarding claim 1, Wallace et al. disclose a method comprising:

receiving a version of a radio signal from a remote terminal at each of a plurality of antennas of a base station (see par.0032);

comparing characteristics of the received versions of the remote terminal signal received at the plurality of antennas (see par. 0059);

using the comparison to determine whether reception at the remote terminal of radio signals transmitted from the base station to the remote terminal is likely to be improved by diversity transmission from the base station (see par.0074);

Wallace et al. fail to disclose selecting to use diversity transmission of radio signals transmitted from the base station to the user remote terminal if reception at the remote terminal is likely to be improved; and transmitting radio signals to the remote terminal based on the selection.

Kay discloses selecting to use diversity transmission of radio signals transmitted from the base station to the user remote terminal if reception at the remote terminal is likely to be improved (see col.5 lines 9-19); and transmitting radio signals to the remote terminal based on the selection (see col.6 lines 20-21). Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of Wallace with the above teaching of Kay in order to provide diversity transmission is only applied to the channel(s) when a channel need arises for quality improvement as opposed to applying diversity transmission tall channels at all times.

Regarding claims 23 and 30, the modified Wallace et al. disclose everything as claim 1 above. More specifically, Wallace et al. disclose a machine-readable medium having stored thereon data representing instructions which, when executed by a machine, cause the machine to perform operations (see Wallace, par.0123).

Regarding claims 2 and 31, the modified Wallace et al. disclose comparing characteristics comprises determining a spatial signature of the received signal (see Wallace, par.0081-0087 and par.0094).

Regarding claims 3 and 24, the modified Wallace et at. disclose comparing characteristics comprises determining relative phases and amplitudes of the received signal (see Wallace, par.0056).

Regarding claim 4, the modified Wallace et al. disclose determining comprises estimating an amount of scattering of the received signal (see Wallace par.0048).

Regarding claim 5, the modified Wallace et al. disclose estimating a level of multipath interference (see Wallace, par.0035-0041).

Regarding claims 6 and 32, the modified Wallace et al. disclose transmitting comprises transmitting a radio signal from two different spaced apart antennas (see Wallace, par.0046).

Regarding claims 8 and 28, the modified Wallace et al. disclose transmitting comprises transmitting a radio signal from the plurality of antennas with two different phase and amplitude signatures (see Wallace, par.0095).

Regarding claim 33, Wallace et al. disclose the diversity transmission comprises a first signal and at least one delayed copy of the first signal (see Wallace, par.065).

Regarding claims 37 and 39, Wallace et al. disclose the received radio signal conforms to a standard for at least one of TDMA, GSM, DAMPS, CDMA, FDMA and TDD (see Wallace, par.0034-0036).

4. Claims 9, 12-18, 22, 26-27, 34, 38 and 40, are rejected under 35 U.S.C. 103() as being unpatentable over Wallace et al. (US Pub 2002/0193146)

in view of Kay (US Patent 5,812,935) further in view of Ylitalo et al. (US Patent 6,788,661).

Regarding claims 9 and 26, the modified Wallace et al. fail to disclose transmitting a radio signal from the plurality of antennas with two different sets of beam forming weights.

Ylitalo et al. disclose transmitting a radio signal from the plurality of antennas with two different sets of beam forming weights (see col.14 lines 31-39). Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of the modified Wallace et al. with the above teaching of Ylitalo et al. in order to provide advantages spatial power or beam width management of independently directed beams to achieve greater spectral efficiency at the base station while minimizing communication-channel interference (as suggested by Ylitalo, col.2 line 65 through col.3 line 5).

Regarding claims 12, 27 and 34, the modified Wallace et al. disclose everything as claim 1 above. However, the modified Wallace et al. fail to disclose an amount of beam forming.

Ylitalo et al. disclose an amount of beam forming (see col.14 lines 31-39). Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of the modified Wallace et al. with the above teaching of Ylitalo et al. in order to provide advantages spatial power or beam width management of independently directed beams to achieve greater spectral efficiency at the base station while minimizing communication-channel interference.

Regarding claim 13, the modified Wallace et at. disclose comparing characteristics comprises determining relative phases and amplitudes of the received signal (see Wallace, par.0056).

Regarding claim 14, the modified Wallace et al. disclose determining comprises estimating an amount of scattering of the received signal (see Wallace par.0048).

Regarding claim 15, the modified Wallace et al. disclose estimating a level of multipath interference (see Wallace, par.0035-0041).

Regarding claim 16, the modified Wallace et al. disclose measuring a signal quality of the received signal (see Wallace, par.0074).

Regarding claim 17, the modified Wallace et al. disclose measuring a signal quality of the received signal as received at a plurality of antennas and comparing the measured signal qualities to each other (see Wallace, par.0074).

Regarding claim 18, the modified Wallace et at. disclose comparing characteristics comprises determining relative phases and amplitudes of the received signal (see Wallace, par.0056).

Regarding claim 22, the modified Wallace et al. disclose selecting comprises choosing one of either beam forming or transmit diversity to be applied to the transmitted signal (see Ylitalo, col.14 lines 31-39).

Regarding claims 38 and 40, Wallace et al. disclose the received radio signal conforms to a standard for at least one of TDMA, GSM, DAMPS, CDMA, FDMA and TDD (see par.0034-0036).

***Allowable Subject Matter***

5. Claims 7, 10-11, 19-21, 25, 29, 35-36, are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Receiver claims 7 and 25, the prior arts fail to disclose, as describes in the specification, the diversity transmissions delaying space apart (1/4x1/B) in function of bandwidth, "transmitting comprises transmitting a radio signal at two different times, the times being spaced by at least the duration of one quarter of the reciprocal of the bandwidth of the modulated waveform of the radio signal" as cited in the claim.

Regarding claim 10, none of prior art teaching "setting transmit weights for a first signal and at least one delayed diversity signal copy based on the determining so that the delayed diversity signal copy receives a weight of greater magnitude if the reception is likely to be improved and a weight of lesser magnitude if the reception is not likely to be improved" as cited in the claim.

Regarding claims 19, 29 and 35, none of prior art teaching "selecting an amount of transmit diversity comprises applying weighting coefficients to a first transmitted signal and a delayed copy of the first transmitted signal, the amount of transmit diversity being greater as the magnitude of the weights are made more equivalent" as cited in the claim.

**Conclusion**

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed Tu Nguyen whose telephone number is 703-305-3427. The examiner can normally be reached on Monday through Friday from 8:30AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, MAUNG NAY A, can be reached at (703) 308-7745. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

**Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks
Washington, D.C. 20231

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington. VA., Sixth Floor (Receptionist).

TN

April 5, 2005

4/10/05

EDAN ORGAD
PATENT EXAMINER/TELECOMM.